COAL MINING

June, 1958 Volume 35, No. 6

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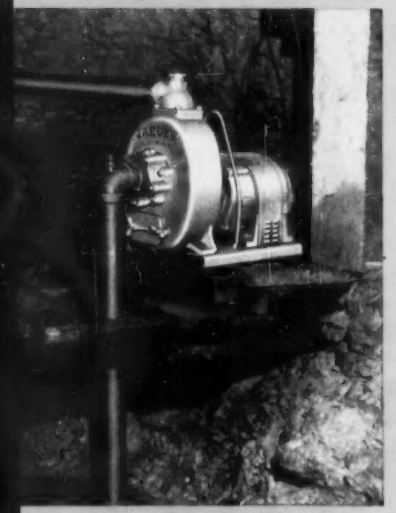
today's mines must have better equipment!

Smooth-running machinery hums a profit tune all its own—a rhythm that's music to the ears of cost-conscious, profit-conscious management.

That's why it pays to rely on Highway. Our experienced equipment specialists help you select exactly the right equipment for your job. We furnish you the latest, improved models designed, built and guaranteed by leading manufacturers. And, we back each equipment item with expert, 'round-the-clock service. AA-7621

Michigan 175As carry heaping loads for Robert Bailey, Philipsburg.

Allis-Chalmers HD-21 clearing overburden at Harold A. Siegel Coal Co., Fryburg.



ll going strong, after over 11,000 hours ntinuous service, is this Jaeger mine pump.

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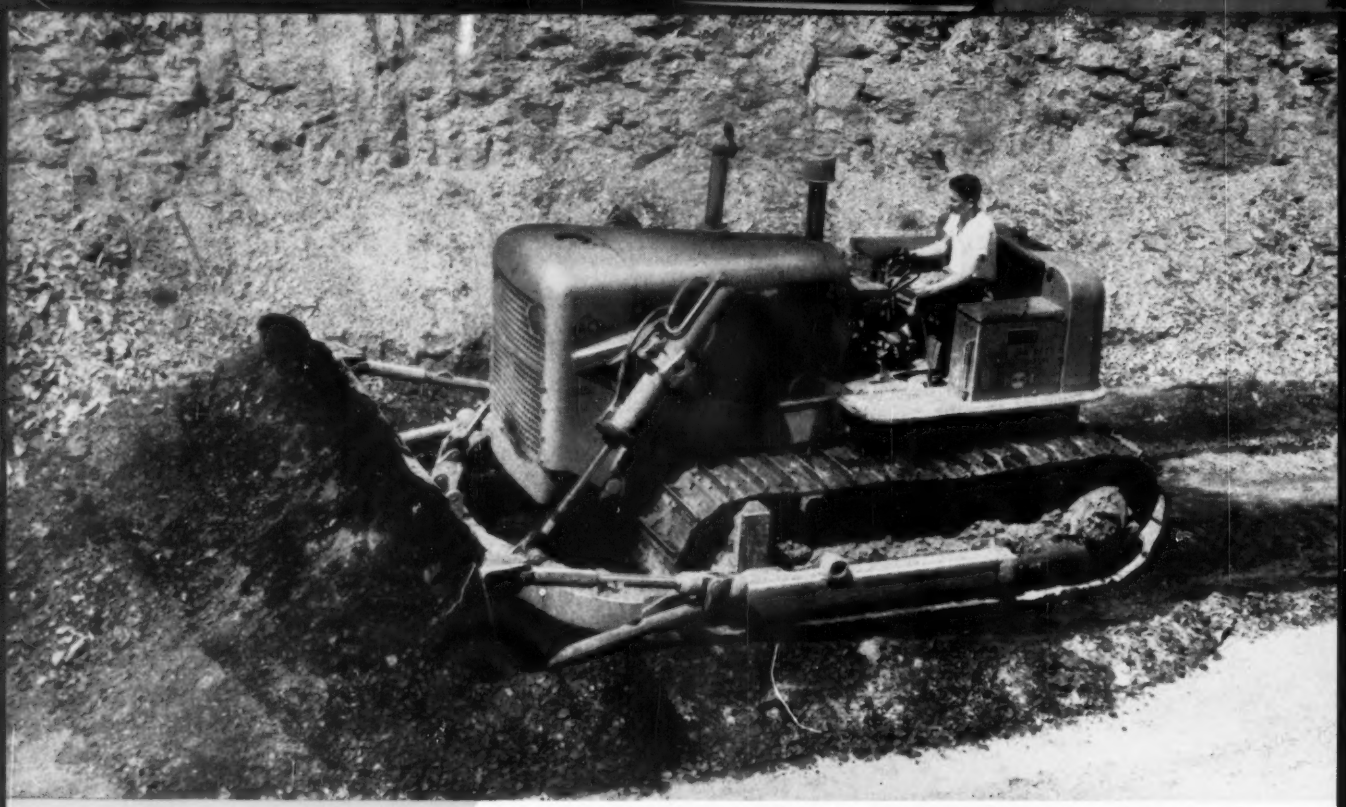

Allis-Chalmers HD-16 . . . Freebrook Corporation, Kittanning, Pa.

Lima 2400 . . . Miller & McKnight Coal Co., Harlansburg, Pa.

It pays to build your production around equipment from Highway

Strip operators everywhere agree that the fastest way to boost production and increase profits is to standardize on equipment from Highway.

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AA-6851

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Auger at LOWEST Cost With a McCARTHY Coal Recovery Drill because . . .

1. **SELF-MOVING in any direction**
2. **2-MAN CREW for all augering**
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A McCarthy drill requires only two men to operate. It moves itself from hole to hole without the help of any extra men or equipment. It delivers more tonnage per horsepower than any other coal recovery drill.

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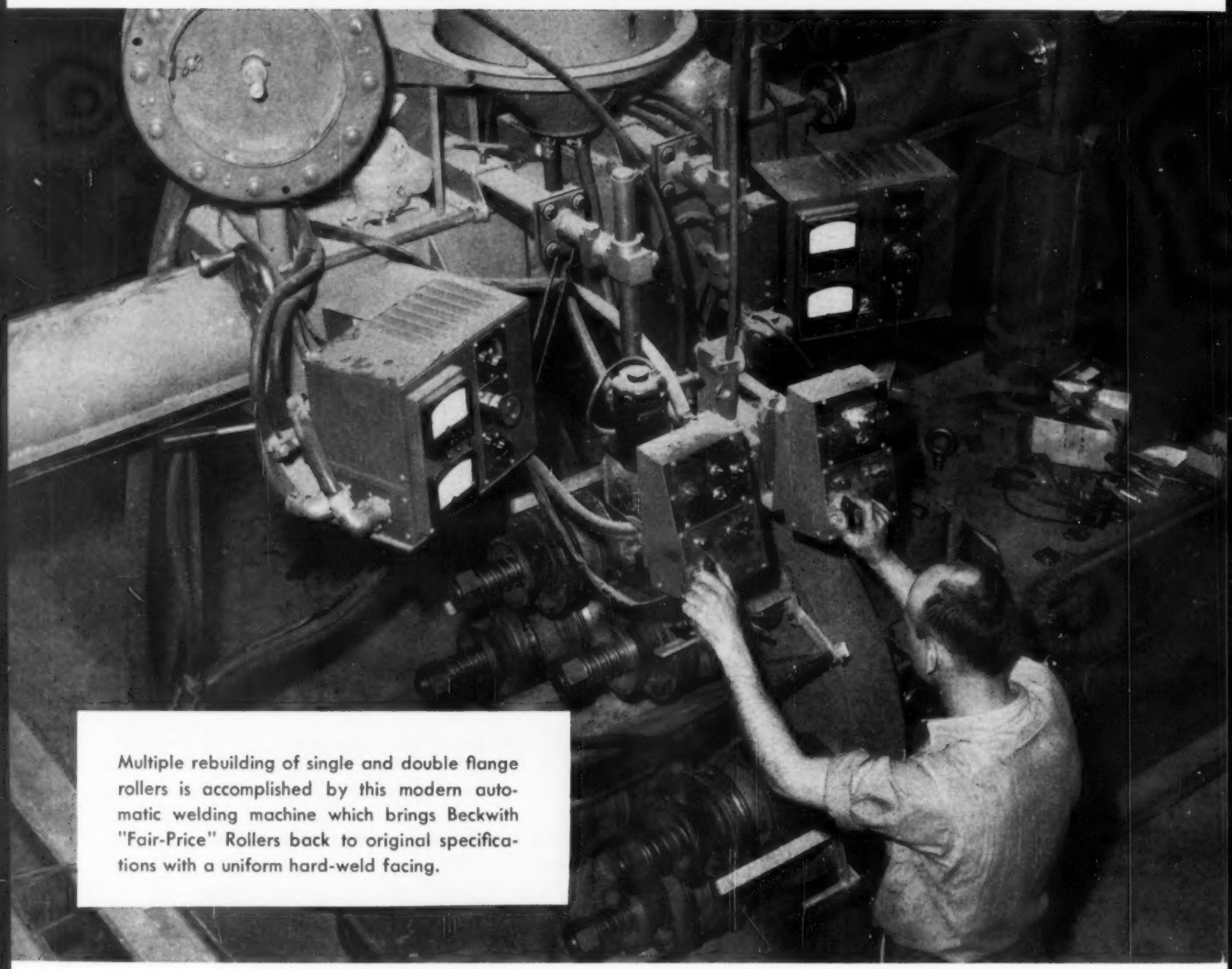
You Save Both Money *and* Down-Time



Multiple rebuilding of single and double flange rollers is accomplished by this modern automatic welding machine which brings Beckwith "Fair-Price" Rollers back to original specifications with a uniform hard-weld facing.

HERE'S AN ADDITIONAL BECKWITH BONUS FOR YOU

You pay only for cost of bringing your trade-in roller up to factory new-parts standards . . . you pay only for shell if shaft is up to specification . . . immediate delivery from stock on most models in "Fair-Price" Roller Exchange Plan.

Our servicemen thoroughly steam-clean, disassemble and degrease rollers which are turned in to us. We throw away worn-out parts and replace them with guaranteed genuine Caterpillar parts. We build up roller face and flanges on an automatic welding machine, using premium quality welding rod.

To insure against flat spots, high build-up, or flanges belling against track guards (defects often found in common rebuilt rollers), we carefully control rebuilding to the precise sizes and contour specified for factory-new parts.

In addition, the roller is bored to factory specifications to assure perfect fit and running clearances between shaft and bushings. No more bushing seizures with a Beckwith "Fair-Price" roller.

with Beckwith's "FAIR-PRICE" Rebuilt Caterpillar* Rollers

THERE is no waiting, no second trip for pick-up when you use Beckwith's "Fair-Price" Roller Exchange Plan. Best of all, you pay only the necessary charges to bring your roller up to specifications – not a flat price which benefits some and penalizes others.

Beckwith's "Fair-Price" Roller Exchange Plan establishes three different classes of wear by which we gauge rollers to be turned in on our rebuilt track rollers. Rollers which need rebuilding but require less welding time will be exchanged at a lower cost than those which fall into a class requiring maximum shop work. You pay a fair price instead of a flat price.

Rebuilt rollers will not be sold outright. For each "Fair-Price" Rebuilt Roller which you purchase, a roller that can be rebuilt must be traded in. A double-flange roller must be exchanged for a double-flange roller. Prices are naturally lower if you exchange only roller shells instead of complete shaft and roller assembly.

A ten percent allowance will be made for any complete "Cat" roller traded on a new factory roller of the same model size regardless of the condition of the traded-in roller. This policy permits you to save money even if your old roller is worn beyond reasonable limit for rebuilding.

May we point out to you the importance of removing rollers while they are still suitable for rebuilding. The less wear, the lower the cost of a Beckwith "Fair-Price" Rebuilt Roller! Wear beyond the limits of the established classes will require a time and material rate. Any of our parts department personnel, equipment service consultants or field representatives will be happy to explain our wear class dimensions for your particular machine.

See for yourself why Beckwith's "Fair-Price" Rebuilt Rollers are the next best thing to new, genuine Cat-built rollers. Exchange your present worn rollers for a Beckwith-rebuilt set now.

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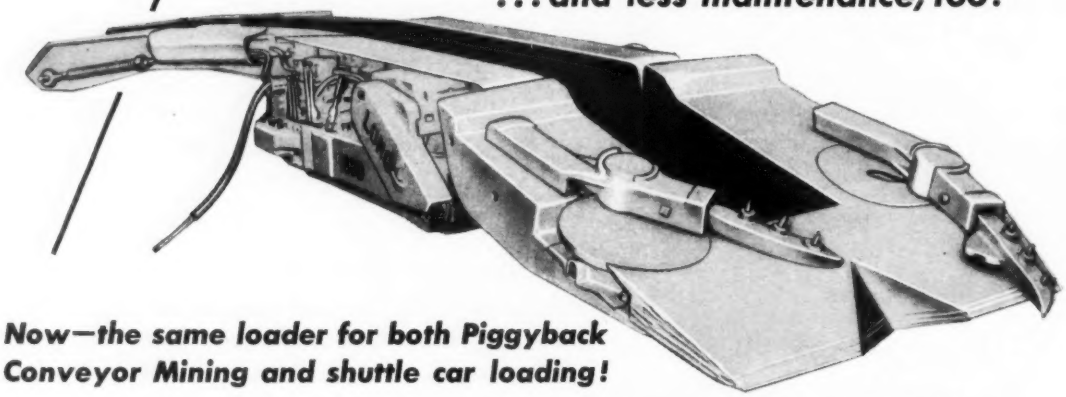
Downtime costs a lot more these days.....

You have a lot less downtime with the LONG

Model 188-D *

PIGLOADER

...and less maintenance, too!



Now—the same loader for both Piggyback Conveyor Mining and shuttle car loading!

With its counter-balanced head and swing boom, the LONG 188-D is specifically designed to work with Piggyback* Mining as well as with shuttle cars. The swing boom feature is an advantage in most Piggyback applications and permits greater versatility with the same loader—even permitting the use of Piggybacks and shuttle cars on the same section.

Time studies prove that the 188-D outperforms any loader for shuttle car loading. Its 25¾-inch height makes it the lowest, high capacity loader on the market. Its unique head design, with flat digging angle and recessed digging arms, permits lifting the head as much as 10 inches off the mine bottom without the strokes of the digging arm exceeding the overall height of the machine. This recessed arm feature has an important effect on actual working height, since in other designs the rear stroke of the gathering arms projects above the overall height of the machine.

In the straightforward, simplified design of the 188-D, there are only a fraction as many control and mechanical parts as in ordinary loading machines. For example, there is only one main speed reducer (instead of four) and only one motor and control. The single 40 horsepower compound wound motor, unlike smaller series wound motors, maintains speed and loading rate in toughest going.

The result—the LONG 188-D is easier to understand; operation is more efficient with less downtime and maintenance; you save on spare parts inventory; upkeep is simplified and easier to perform.

And you get all these advantages to boot!

Lower first cost • High capacity operation at lowest cost per year • Single 40 HP electric motor drives all machine operations—provides maximum digging and tramming power • All functions are controlled hydraulically from a single bank of control valves • Long wheel base and wide tracks give exceptional stability and positive operation • Lowest operating height (25¾") of any high capacity loader.

*Trade marks Reg. U.S. Pat. Office

For details or a demonstration, write . . .

Modernization on the 88 and 188 designs is simple. Any 88 or 188 in the field may be modernized to the latest 188-D design at reasonable cost.

The LONG Company
Oak Hill, W. Va.

COAL MINING

Vol. XXXV June, 1958 No. 6

Contents

Here and There in the Coal Industry ---------- 6

Automation in Coal Mines? How Soon? ---------- 10

Automatic Coal Proportioning System Extends Mine Life, Assures Uniform Top Quality Output at World's Largest Coal Preparation Plant ---------- 11

New Highway Branch Serves Rich Coal Stripping Area ---------- 20

Advertiser's Index ---------- 26

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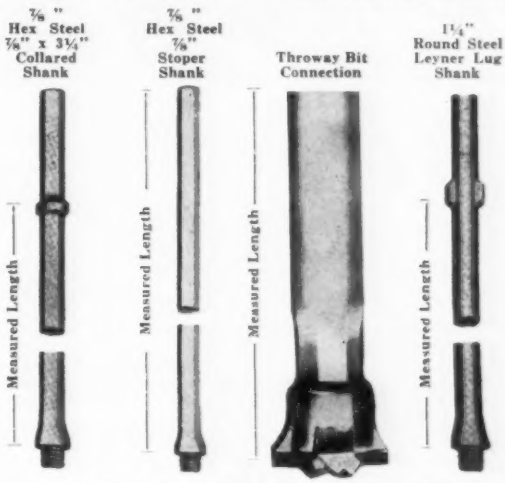
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Reconditional Service

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SALEM "HERCULES" AUGERS FOR ELECTRIC DRILLS
Made to Withstand High Drilling Speed Whip And Torsional Strain Of Electric Drills.

Drills holes faster — Will not snap off shank or chip points — Outlasts four or five ordinary augers.
THE SALEM TOOL COMPANY EDgewood 7-3416 SALEM, OHIO, U.S.A.

HERE AND THERE IN THE COAL INDUSTRY

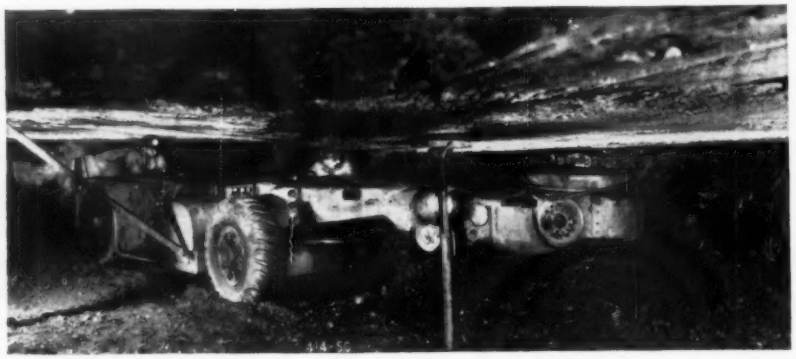
● The 48th Annual Convention of the Mine Inspectors Institute of America will be held in Denver, Colorado, June 22, 23, 24 and 25, 1958. Headquarters for the convention will be the Shirley-Savoy Hotel.

The Program Committee, as usual, has arranged an interesting program on matters pertinent to present day mining problems, and they have selected qualified persons to present papers on the subjects they have selected.

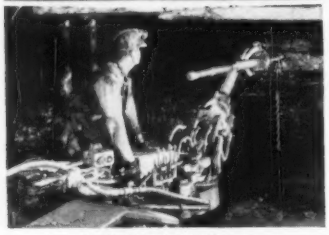
Part of this program will be presented on Monday afternoon, June 23rd and again on Wednesday, both morning and afternoon, June 25th.

The entertainment part of the program, arranged by our genial host, Mr. Thomas Allen, and his Committee, has been completed and it is apparent that all who are present at the convention will have an enjoyable time.

Sunday, June 22, registration will be conducted during the afternoon and evening, which will be followed by the usual get-together at a Buffet Dinner. Monday, June 23rd, the ladies attending the convention will be taken on a short trip throughout the Denver area. During the evening a cocktail party will precede the Annual Banquet. Tuesday, June 24th, generally called "Play Day," a mountain tour for all attending the convention, with an evening cocktail party and Western-Style Supper. On Wednesday, June 25th, the ladies will be escorted through the fashion center of Denver.



70-UR UNIVERSAL CUTTER ▲
▼ 56-RDR ROOF DRILL



56-FHR FACE DRILL ▲
▼ 81-A HIGH CAPACITY LOADER

Up coal production . . .
with this hard-working
JEFFREY team

Mine superintendents brag about the tonnage-producing ability of this underground team . . . the Jeffrey universal cutter, high capacity loader, face drill and roof drill. Each of these hard-working machines is packed with design features which add ease and efficiency to mining operations. And rugged Jeffrey construction cuts maintenance cost and downtime . . . assures long, trouble-free service.

Write for details on a particular machine or the complete underground service team. The Jeffrey Manufacturing Company, 969 North Fourth Street, Columbus 16, Ohio.

Available for AC and DC operation

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...
TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

● What is believed to be the first car load shipment of stoker coke produced by a continuous process in conjunction with steam generation was made by Island Creek Coal Company. Three carloads of the new product were produced on a test basis in cooperation with the P & L E Railroad at its plant in McKees Rocks, Pa., and shipped to a chemical plant for use in producing calcium carbide.

This initial shipment is the culmination of more than two years of laboratory research on the production of stoker coke from Island Creek's Scarlet Flame low-ash coking coal.

● HOWARD LEWIS, vice president in charge of production for Old Ben Coal Corp., Chicago, will retire June 30 after 38 years. George A. Strunck, presently superintendent of plants, has been elected vice president in charge of production, effective July 1, and William C. Campbell, who has been assistant to Mr. Lewis, will be transferred to Chicago as assistant to the president. Mr. Lewis is a brother of John L. Lewis, president of the UMWA.

"Less maintenance problems with BUCYRUS-ERIES... less downtime, more pay hours for me!"

—says 22-B operator at Iowa mine

"I've had experience with Bucyrus-Eries and several other makes," says Wayne Zeck, Knoxville, Iowa, who operates a 22-B coal loading shovel for Beard Coal Company. "I've found that you have far less maintenance problems with Bucyrus-Eries. That means less downtime and more pay hours for me."

MORE OUTPUT, too,

for Owner, Byron Beard

"Bucyrus-Eries prove as good as you expect them to," states the veteran strip miner whose Flagler mine has been in operation since 1934. His 22-B, equipped with 1⅛-cu. yd. coal loading dipper, loads coal during an 8½-hr. shift. "Engineering-wise, this 22-B is a swell machine. I like the machinery layout, and I especially like the power system for its long life with little maintenance!"

You can enjoy the same low upkeep, high output pit operation. With a Bucyrus-Erie 22-B shovel, you get more working time each hour of every shift — more daily output — because:

It stays on the job. It's built tough. Quality materials provide strength, durability, all-weather stamina. Parts are simple, large, few in number — there is little that can go wrong. Machinery is arranged simply, compactly so that maintenance can be handled quickly with little downtime. It's easy to keep a Bucyrus-Erie going at top speed. Exceptional synchronization of speeds and power assures smooth, well balanced work cycles . . . fast, responsive controls.

Stop in and chat with your nearby Bucyrus-Erie distributor. He'll gladly give you the complete story on the popular 22-B, or any other model — ranging from ⅜ to 4 cubic yards.

544E58

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

That's LOW COST STRIPPING!

Page Model 726 Walking Dragline with 12 cu. yd. bucket and 150-foot boom.

Uncovering **500 - 800 - 1,000 tons** a day –
removing **50 - 60 - 80 ft.** of overburden

You get MORE YARDAGE AT LOWER COST when you put a Page uncovering your coal. See actual records of Page Walkers stripping at a profit, where smaller machines lost money (we would like to send you some.)

A top profit-maker is the Page Model 728 with 150 ft. boom and 12 cu. yd. bucket. You can get Pages up to 22 cu. yd. capacity.

They have the SPEED. Page Walkers swing unusually fast — have a correspondingly fast hoist line — quicker cycles and more yardage.

And you get extreme low-cost operation with Page's V-type Diesel engine, designed for dragline work with bigger bearings and pistons, slow speed. (Furnished with Electric Power if you want it.)

GET AN ESTIMATE OF YOUR OWN STRIPPING COST with a Page. We'll be glad to figure it from accurate records of what has been done. Write, wire or phone —

FRANK SWABB EQUIPMENT CO.
Hazleton National Bank Bldg.
Hazleton, Pa., Phone Gladstone 5-3658

For High Production and Lowest Operating costs —

NOTHING equals this PAGE 700 series

SINGLE DECK WALKING DRAGLINES

D8 with "U" blade cuts reclamation job time in half

...now Davidson Mining operates three

Based on their experience with a 256 H.P. straight blade tractor, Davidson Mining Company of New Philadelphia, Ohio bid a reclamation job in Stark County figuring it would take sixteen 10-hour days.

They got the contract, and a few days later, decided to put their new 191 H.P. Caterpillar D8 Tractor with Cat 8U blade on the job instead. The D8 completed the work in eight days, half the time their old machine would have required.

Along with Davidson's other Cat-built machines the D8 shown above is pushing shale at the company's new mining operation 30 miles south of New Philadelphia. After stripping 30 feet of overburden for coal, Davidson will remove a deposit of commercial clay. The D8's will do 75% of the stripping to reach the vein of coal.

"The D8 is just right for our stripping and reclaiming work," says Art Davidson. "We're operating three of them now. They're reliable producers, built rugged. The 8U blade is ideal for sidehill cutting, and you can always count on a full blade."

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OHIO MACHINERY CO.

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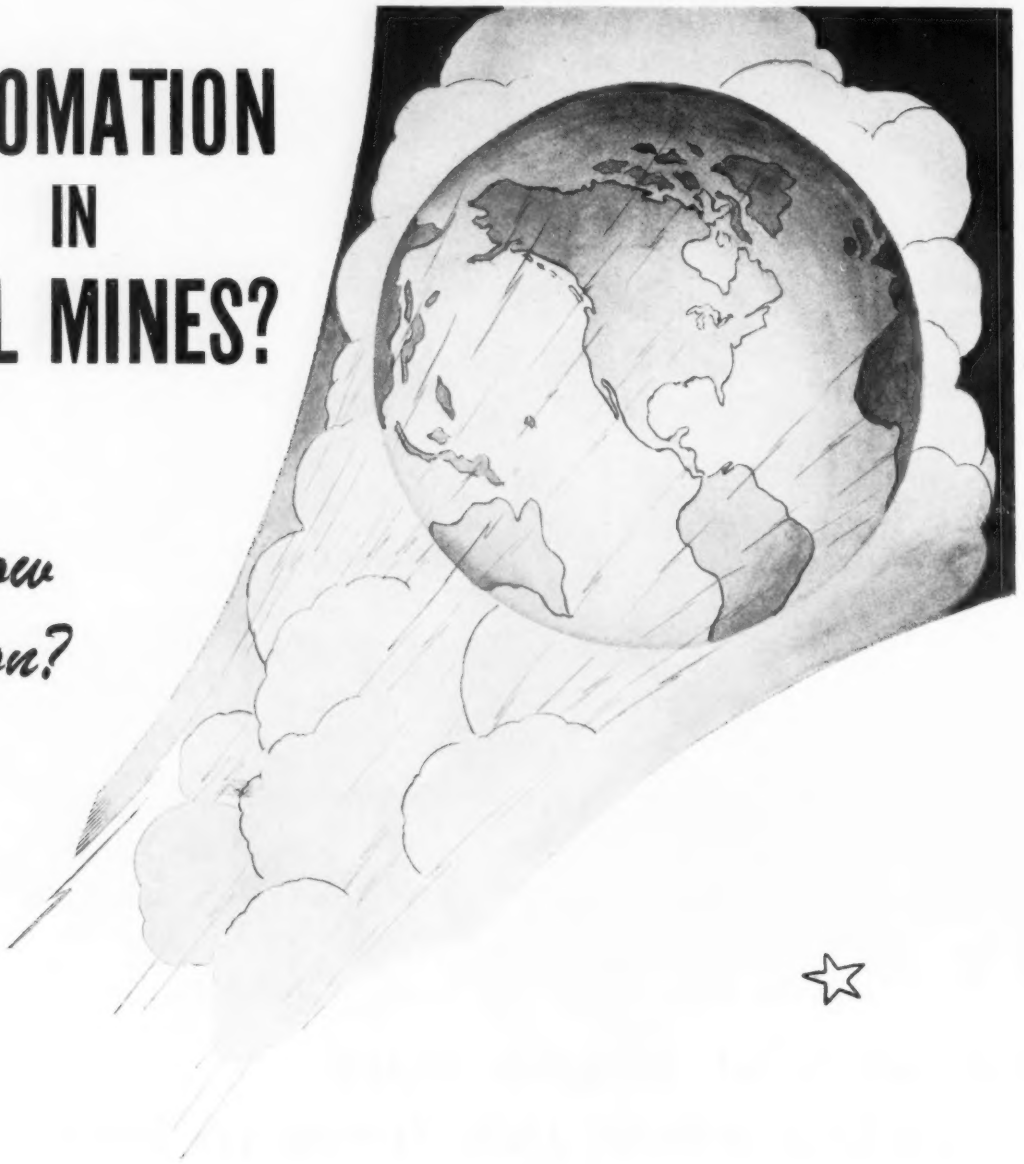
AUTOMATION IN COAL MINES?

How Soon?



"It is inconceivable that we shall continue to understand either ourselves or our relations with one another if educated people remain in their present ignorance of the nature of science."—Julius A. Stratton.

Up to now, the educated people in the coal industry have elected to remain ignorant of the nature of science and its application to their industry. The pressure of the sciences in industry has been upon the coal man for some time now, with no apparent effect on its present personnel.

Men in the coal industry must realize that in the present world, scientific operation of machinery has crossed the critical threshold and that they must do something to bring their industry up to the times.

No one industry has a monopoly on creative talent and present scientific sinews are adequate to develop automatic mining machines. Practical problems of automation and their immediate application to the coal industry are of critical importance today. By scientific comparison of automatic operation of machines in other advanced industries, coal mining men can learn to build the types of machines that will produce their product automatically.

Automatic Coal Proportioning System Extends Mine Life, Assures Uniform Top Quality Output At World's Largest Coal Preparation Plant

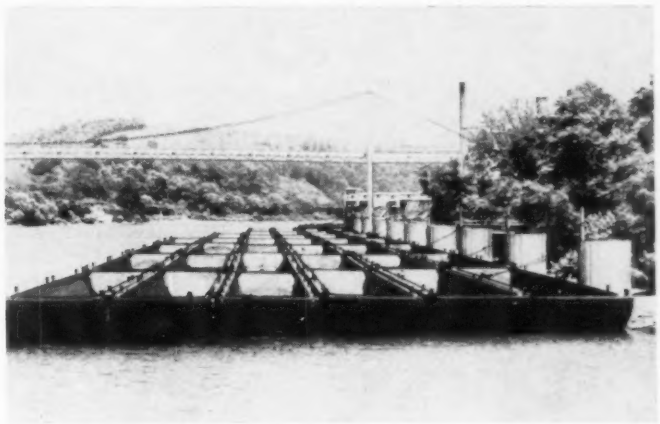


Fig. 1 — Empty coal barges moored at Jones & Laughlin Coal Preparation Plant, East Fredericktown, Pa. Bridge in background holds Belt Conveyor that carries raw coal from the Vesta mine to the plant.

Solids in transit can be mixed in a controlled proportion even though it is not economically practical to control the flow of one of the materials. Uniform high quality coal for coke oven use is obtained with an electronic continuous proportioning system that mixes high volatile coal from the Vesta mine at an uncotrolled variable flow rate with high volatile coal, from the Shannopin mines.

* * * *

● For many years the Vesta and Shannopin mines at East Fredericktown, Pennsylvania have supplied a major portion of the high grade metallurgical coal necessary for coke production at Jones & Laughlin Steel Corporation's plants at Alliquippa and Pittsburgh, Pa. After mechanical loading facilities were installed during World War II, the Vesta-Shannopin operation was enlarged to include complete preparation facilities making it the world's largest coal preparation plant. The latest addition to this mechanization program has been the construction of facilities for mixing coal from the Shannopin mine up stream on the Monongahela River with the output of the Vesta mine.

Mixing of these two coals is regulated by a completely automatic weighing and proportioning system. After several months operation the proportioning system has proved completely successful in controlling the mixing in spite of

Fig. 2 — Prepared coal is loaded into barges at East Fredericktown for shipment downriver to Jones & Laughlin mills.

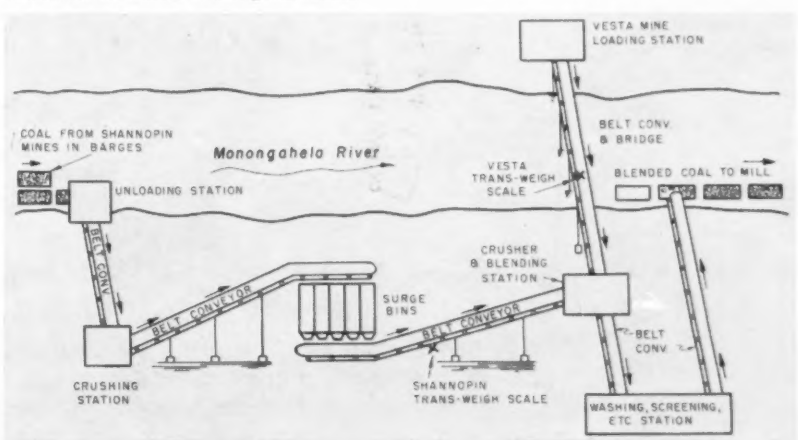


Fig.3 — Schematic flow diagram for continuous coal proportioning system.

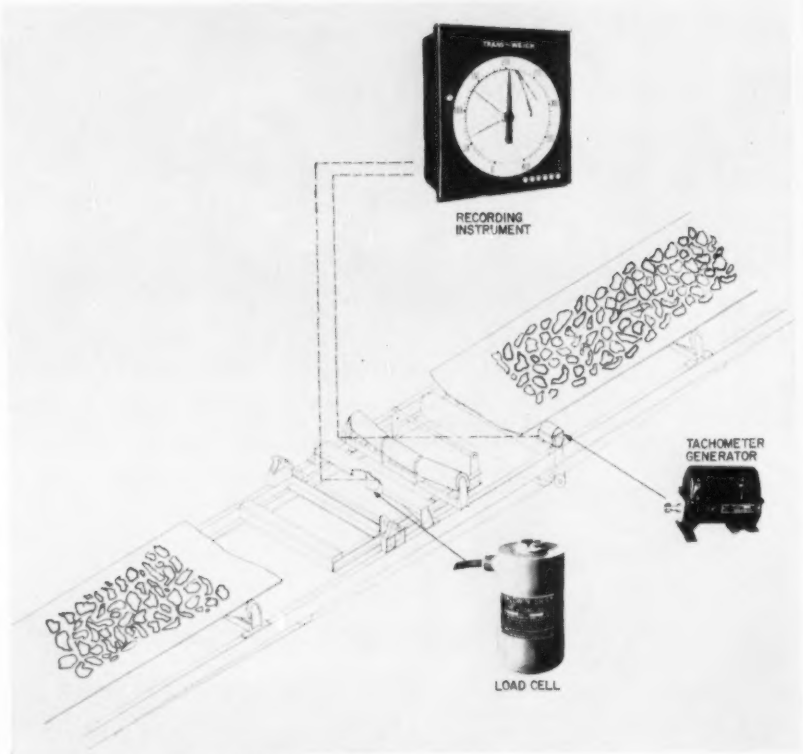


Fig. 4 — Basic Trans-Weigh weighing system.

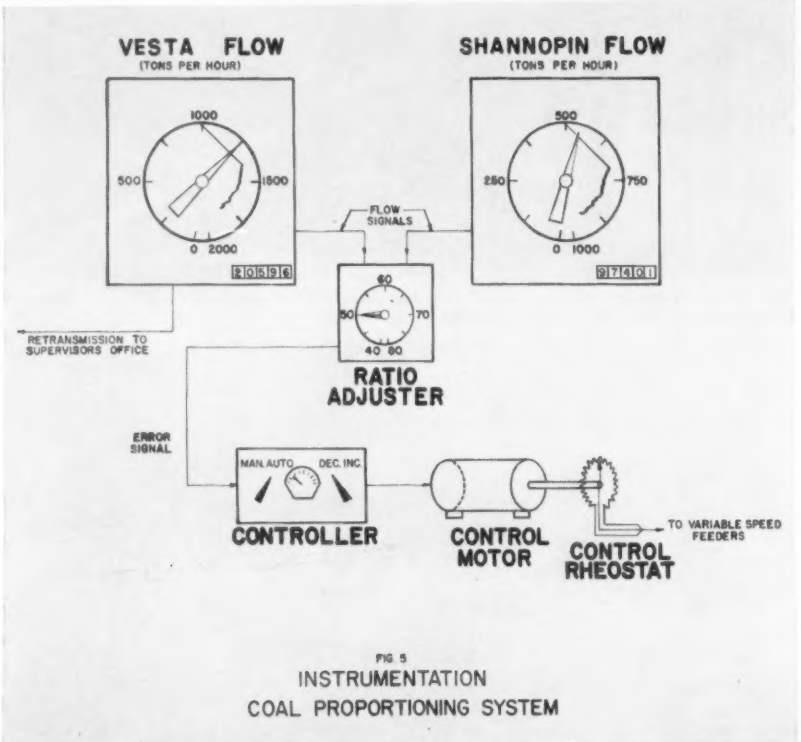


Fig. 5 — Schematic diagram of Trans-Weigh instrumentation for the Vesta-Shannopin coal proportioning system.

variations in the Vesta flow.

Prior to the installation of the continuous proportioning system, coal from both the Shannopin and Vesta mines was transported down the river by barges directly to the mills. It was decided that the entire operation could be streamlined and operated more economically by mixing the outputs of the Vesta and Shannopin mines at the East Fredericktown preparation plant —and then transporting the mixed coals by barges to the mills. Following this decision, consulting engineers were engaged to design and construct the necessary facilities at East Fredericktown. Automatic weighing and proportioning equipment was required, and after investigating all possibilities, an electronic system, engineered and built by the Trans-Weigh Company, Wayne, Pa., was selected and installed.

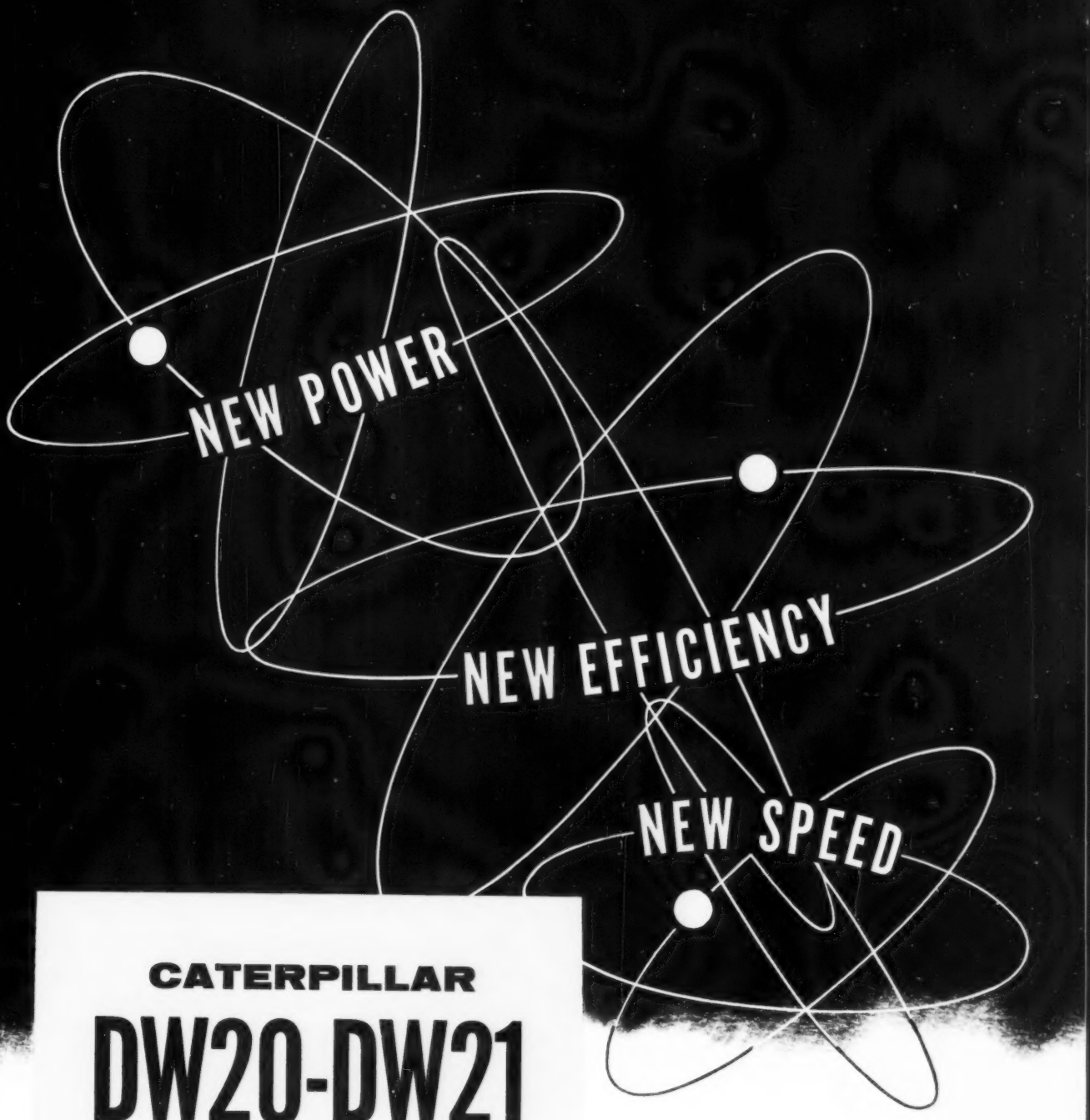
Vesta coal from the other side of the river

A simplified flow diagram for the two types of coal up to their Junction point is shown in Fig. 3. High volatile Vesta coal from the local mine is unloaded by two rotary dumps into a common hopper. After initial screening and crushing in a chamber approximately 170 feet below ground surface, an apron feeder transports the coal above ground at an average rate of 1,300 tons per hour. The coal is then carried across a suspension bridge spanning the Monongahela River on a belt conveyor about 2,000 feet long.

There is very little storage capacity in this phase of the system — costs for bins, feeders and the like to provide extensive capacity were prohibitive. Lack of adequate storage capacity made it impractical to provide minute-to-minute control of the primary flow.

Shannopin coal from mines up stream

Shannopin coal is unloaded from barges and transported by belt conveyor to ten bins having a total



CATERPILLAR

DW20-DW21

pay-off in faster cycle time

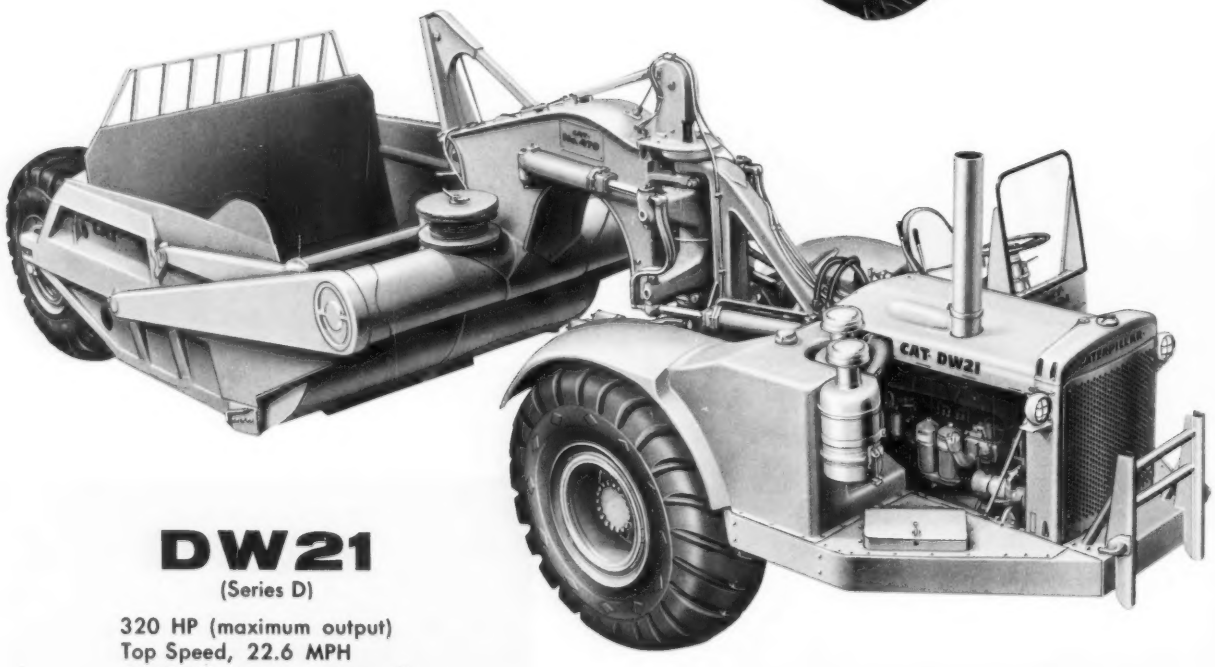
NEW PRODUCTIVE PERFORMANCE

YOU CAN MEASURE IN PROFIT

DW20

(Series F)

320 HP (maximum output)
Top Speed, 35.8 MPH
35,310 lb. Maximum Rimpull



DW21

(Series D)

320 HP (maximum output)
Top Speed, 22.6 MPH
43,710 lb. Maximum Rimpull

A new-look radiator guard gives additional protection up front. And on the DW21 a new bumper provides even more safeguard against damage.

Here they are: New Cat DW20 (Series F) and DW21 (Series D) Tractors—more powerful—faster—more efficient—more productive than ever!

NEW POWER

New DW20s and DW21s have 320 HP (maximum output) and a 28% torque rise—*twice* as much as before! And at rimpulls equal to the previous machine, speeds are 10% faster. Here's what all these mean to you:

Extra pull in the cut—faster acceleration—higher haul speeds—fewer shifts—better gradeability—that's what you get in the new, more powerful DW20s and DW21s.

NEW EFFICIENCY

The extra performance comes from the Super-Turbo Engine. This amazing power plant incorporates a new concept in diesel engine turbocharging—an air induction system unique in earthmoving machines . . . and another Caterpillar first. This system allows use of more of the Turbocharger's potential than was possible before. Results: a big torque rise, higher horsepower, better acceleration and gradeability. But more important, faster cycles, greater production and more profit—*for you.*

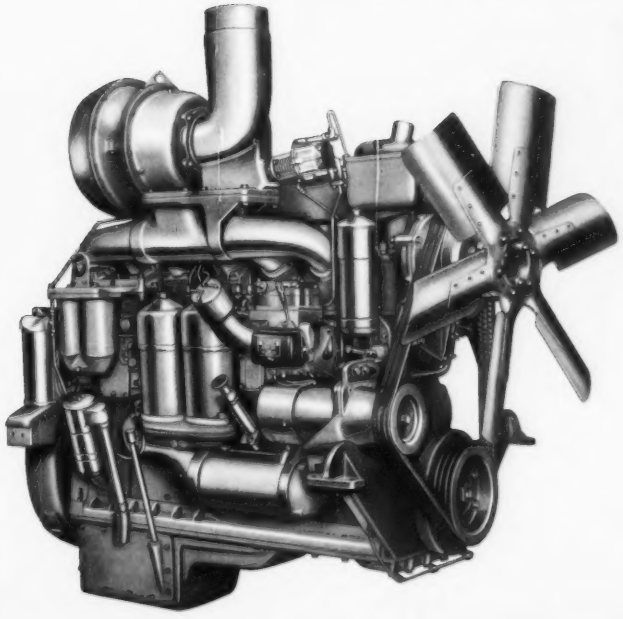
NEW SPEED

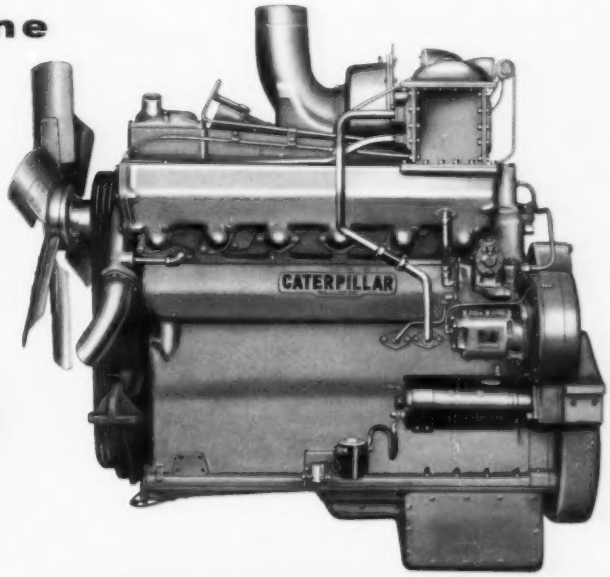
New power is translated into higher speeds in the DW20s and DW21s. You profit here, too, by reducing cycle time—cutting costs—boosting production. Overlap of speeds and rimpull provides the exact speed selection needed for peak operating efficiency.

Over the years DW21s and DW20s have set the pace for the earthmoving industry—leading the field, proving their capacity to move material faster and more profitably than any other machines in their classes. This leadership is again demonstrated by their new Super-Turbo Engines. Your Caterpillar Dealer will gladly show you this new concept of engine power—and demonstrate its application in Cat wheel Tractors.

New Super-Turbo Engine

features longer life, lower upkeep costs, more profits to you





CATERPILLAR

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Super-Turbo Engine
. . . First in the Industry
. . . First in Performance

PROFIT ON YOUR SPECIAL HAULING JOBS, TOO, FROM THE NEW POWER IN CAT DW20-DW21s

Take advantage of the extra power, capacity, speed and efficiency you'll find in DW20s and DW21s by teaming them up with specially designed, matched Athey Trailers. These units are easily interchangeable with Cat No. 470 and No. 456 Scrapers. They give you the flexibility and maneuverability of tractor-trailer design, plus big capacity, off-or-on the road haulability, dependability and economy. Two such Athey hauling units are illustrated here: (above) the Cat DW21 with 22.5 cu. yd. PR21 Rear Dump Trailer, and (below) the Cat DW20 and 27 cu. yd. PW20 Bottom Dump. Also available as running mates for the DW20 are the 22 cu. yd. PD20 Side Dump and 22.5 cu. yd. PR20 Rear Dump.

We'll help you select the right combination of tractor and matched equipment for your needs—the combination that gives you maximum return and earning capacity. Our entire organization—sales, service, parts—is at your call. See us for further information.

YOUR CATERPILLAR DEALERS

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2807 Reynolds Road TOLEDO	OHIO
U. S. Route 250 CADIZ	
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WALKER MACHINERY CO.

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CM-7V

THE ONLY COMPLETE TRACTOR-TRAILER LINE... *and by the Leaders*

DW1412

Printed in U.S.A.

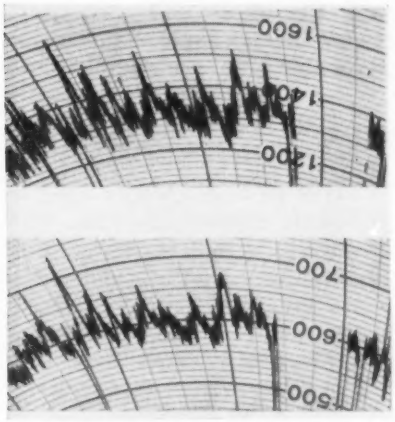


Fig. 6 — Segments of typical charts from Vesta and Shannopin flow recording-controlling instruments. Flows recorded simultaneously. Top segment shows Vesta flow — bottom segment traces Shannopin flow, which closely follows the Vesta flow rate.

capacity of about 5,000 tons. Ample storage capacity was chosen to permit two-shift operation of the preparation plant with one-shift unloading of the barges. Since there is always excess coal available, accurate propotioning can be accomplished by controlling the flow rate of the Shannopin in proportion to the Vesta coal.

Each bin is equipped with a belt feeder — speeds of all feeders are controlled together by one rheostat — but up to five of the feeders may not be in use at any one time. A collection belt carries the Shannopin coal from the feeders at an average rate of about 600 tons per hour to an inclined conveyor that in turn transports the material to the jointure of the two flows. The resulting mixture of Vesta and Shannopin coals is then conveyed to the preparation plant for final processing.

Operation of the basic Trans-Weigh system

A typical basic Trans-Weigh measuring system is illustrated in Fig. 4. This system measures the weight of material on a short section of the belt, and also the belt speed, and then multiplies these two variables electronically to obtain the pounds per hour being delivered. The three primary components of this system include (a) an electric tachometer generator driven by the return belt which measures belt speed and supplies current to the weighing system; (b) an electric strain gauge load cell which measures the belt load; and (c) a specially modified electronic potentiometer which indicates and records instantaneous rate of flow

Fig. 7— View of Jones & Laughlin Coal Preparation Plant, East Fredericktown, Pa. from Vesta mine end of bridge. Shannopin coal conveyor runs upward from right to left — refuse conveyor runs upward left to right.

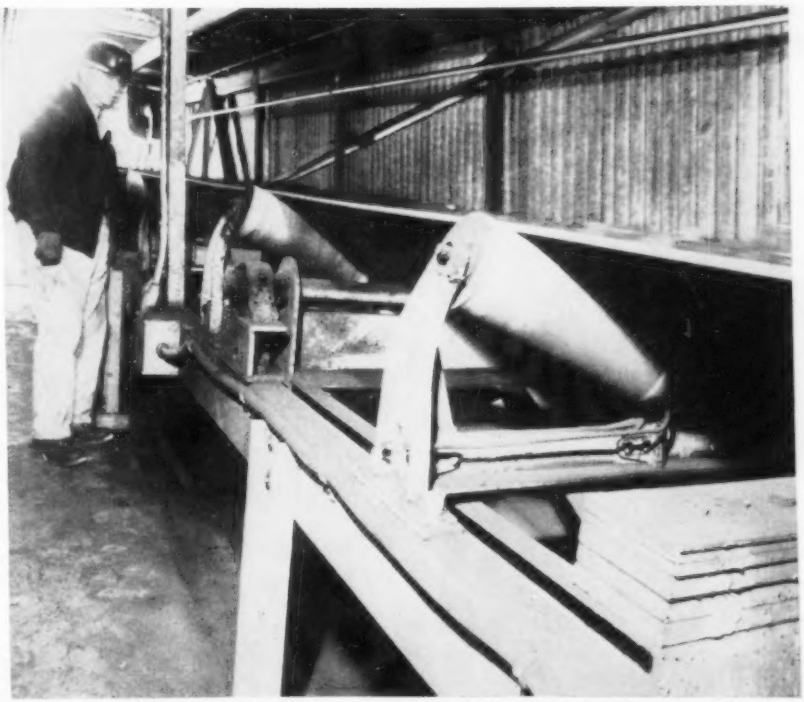


Fig. 8 — Scale carriage for the Trans-Weigh Shannopin scale. Carriage is located just beyond loading point on the inclined conveyor beyond the storage bins.

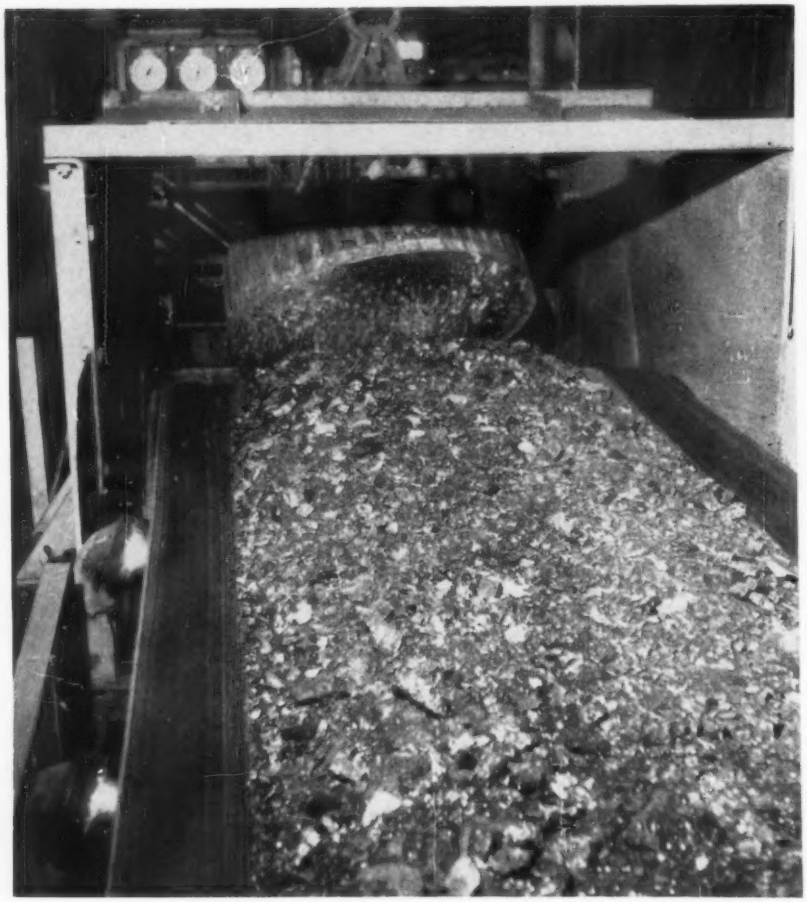


Fig. 9 — Head end of the Vesta flow conveyor. Junction of the Shannopin and Vesta streams follows after this point.

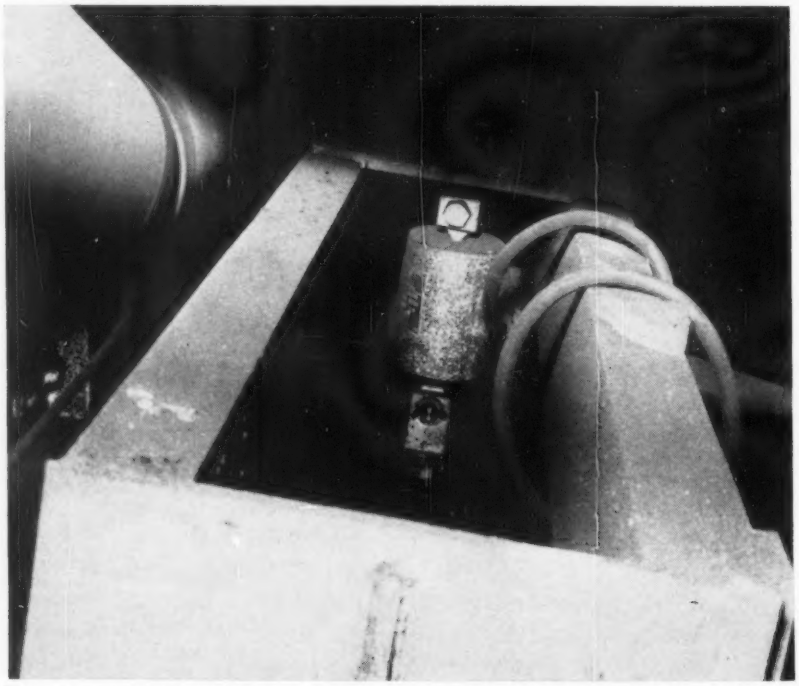


Fig. 10 — Location of the electric strain gauge load cell under the Shannopin conveyor. This element of the Trans-Weigh system measures the belt load.

and also includes an integrator which displays totalized tonnage on a small counter.

Time lags equal in Vesta-Shannopin proportioning system

In the Vesta-Shannopin coal proportioning system, the Vesta flow is detected by a Trans-Weigh scale comprising a load cell and tachometer generator located part way across the bridge, while the Shannopin flow is measured by similar scale located just after the loading point on the inclined conveyor. Location of the Vesta detecting devices was selected so as to make the time lags approximately equal between each scale and the junction point. Thus, when Vesta tonnage varies, the control system immediatly affects a proportional change in the Shannopin feed rate, and the two changes meet at the junction point at the same time.

Both Vesta and Shannopin feed rates are transmitted to a central control station near the junction point. Primary output and totalized tonnage are also retransmitted about another 1,000 feet to a duplicate instrument in the superintendent's office.

Control action of the Vesta-Shannopin system

The Trans-Weigh continuous coal proportioning system is shown schematically in Fig. 5. Automatic proportioning is accomplished by the following sequences. The operator sets the desired ratio of Shannopin to Vesta flow by a calibrated dial adjustment on the ratio adjuster. The ratio adjuster receives flow signals from the recorders proportional to actual measured feed rates. These measured and desired feed rate signals are compared and the difference is an error voltage which goes to the controller. The controller, through a motor and rheostat, then increases or decreases the speed of the feeders to bring the error voltage back to zero.

If the conveyors should stop, for example when the primary belt

accidently trains off to one side and trips a limit switch, the control motor is driven to the low-speed position by an interlock. Originally, it was assumed that the operator would switch to manual control when restarting the belts and bring the Shannopin flow up close to the desired value before switching to automatic. However, this step is not necessary, and the control is left on automatic. When the system is restarted the controller automatically brings the secondary feed up to the correct value without overshooting.

Chart records tell the story

Performance of the TransWeigh proportioning system is illustrated in Fig. 6 by segments of the instrument charts. Both segments are from 24-hour circular charts having 15-minute time divisions. The top chart section shows the Vesta or uncontrolled flow rate—the bottom section illustrating Shannopin flow.

Variations of 10% occur often over periods of about 10 minutes, and peaks of 25-30% occur occasionally. The control problem is to make the Shannopin feed follow these variations—which it did, as shown by the bottom chart section that recorded the secondary feed at the same time as the primary feed.

The system was started with control on automatic at the right side of the charts (time increases from right to left in this illustration), and the Shannopin flow rate came up to 600 tons per hour without overshooting. The large peak on the left of the primary record was paralleled on the Shannopin record, after which a brief shut-down took place, and the system restarted—all while still on automatic.

Peaks and valleys in the Vesta record are closely followed by the Shannopin record. Occasional peaks in the Shannopin flow occured when a new feeder was turned on.

Plus Benefits Too

Advantages of the Trans-Weigh system include not only the solution to the original problem of providing a uniform high quality mixture, but also definite secondary features. The system is completely automatic so that operators do not have to switch to manual control when stopping or starting the conveyors. Location of the additional Vesta flow recording and integrating instrument in the superintendent's office permits simplified supervision of the system.

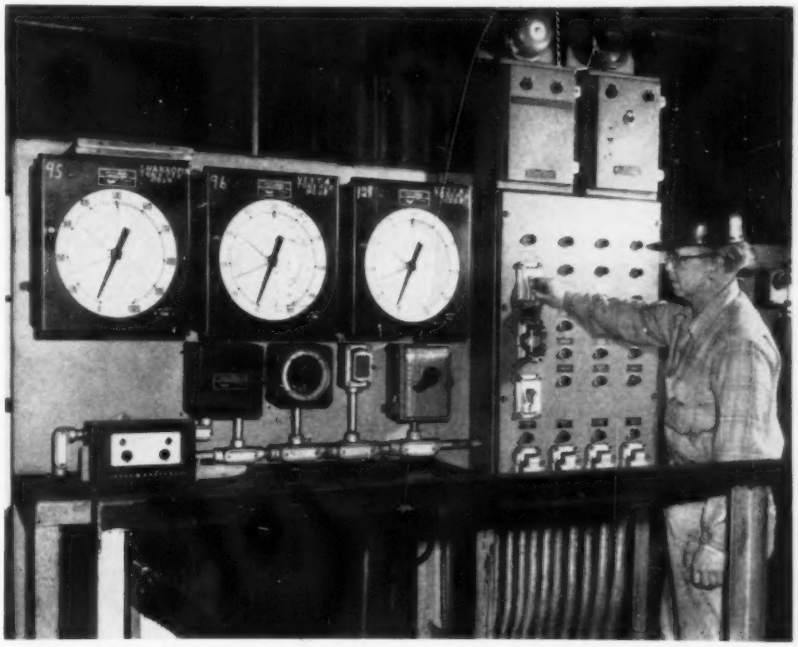


Fig. 11 — Master control panel for the Trans-Weigh Proportioning System. Plant Engineer, H. E. Steinman, is adjusting feeder speed. Instrument at right is not part of control system — it records and integrates Vesta flow separately.

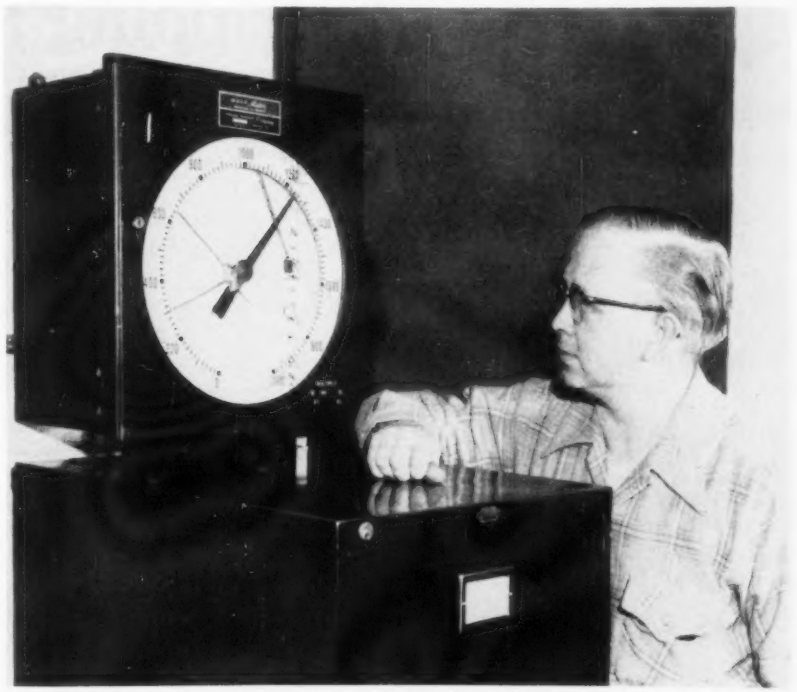
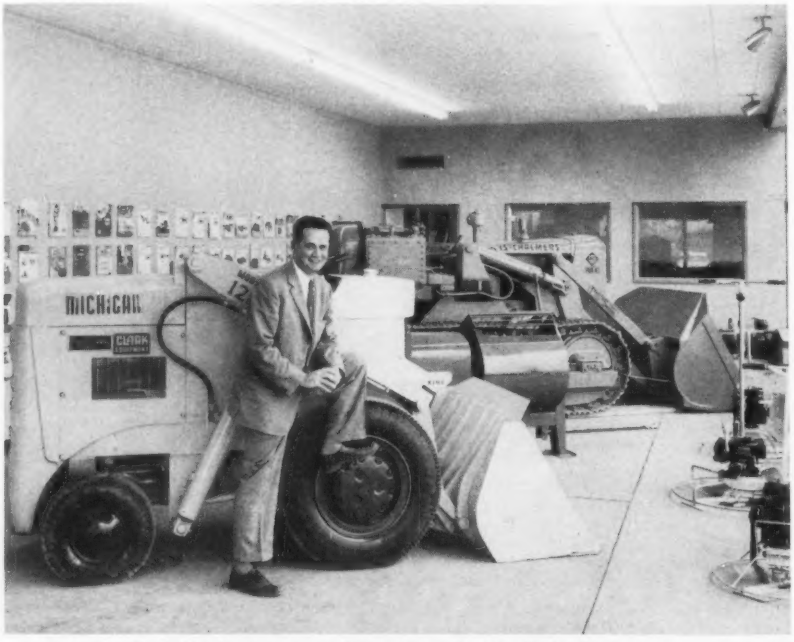


Fig. 12 — H. E. Steinman, Plant Engineer, checking Vesta flow rate from this Trans-Weigh recorder in superintendent's office — approximately 1,000 feet from Vesta flow recorder-controller on master control panel.

New Du Bois branch of Highway Equipment Company is located at 40 Hoover Avenue.

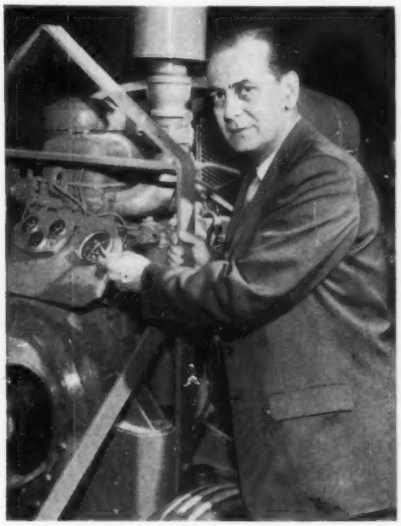
New Highway branch serves rich coal stripping area



Jack Docherty, general manager, in Du Bois showroom.

After several months of intensive preparation, Highway Equipment Company of Pittsburgh opened its new Du Bois, Pa., branch on June 16. Located at 40 Hoover Avenue, it is ideally situated to meet the needs of the rich coal stripping area in and around Clearfield, Jefferson and Clarion Counties and adjacent territory.

The Du Bois plant will function as a combined sales, service and parts headquarters under the direction of Jack Docherty, general manager. It contains a modern showroom; well-stocked parts department and extensive service facilities. Built with its own siding on the B & O Railroad, it lies in the middle of a 2 acre plot that assures ample space for future expansion, storage of used equipment, parking, etc.



Gene Lerch, 13 year Highway veteran, is service manager.

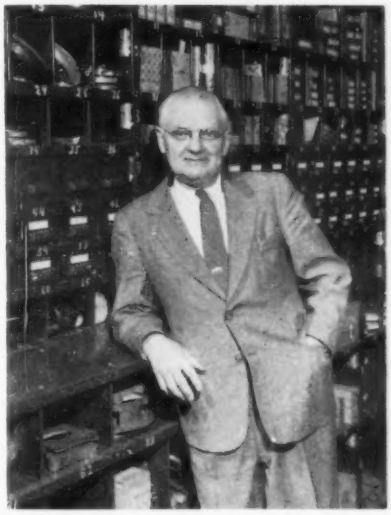
Overhauling Allis-Chalmers HD-19 in service department.

According to Docherty, the service department has facilities for repairing every type of modern equipment. Staffed with 7 full time mechanics, it is supervised by Gene Lerch, who has 13 years experience with Highway at its main Pittsburgh plant.

Another cornerstone of the Du Bois operation is the 4,000 sq. ft. parts department headed by Bob Cooper. A veteran of 9 years with Highway, Cooper is by experience and training an expert in traffic and transportation. As parts manager, he will anticipate customer parts requirements and supervise shipping and receiving.

Du Bois will also be headquarters for several of Highway's salesmen. This group will include Jack Jannsen and Lou Lenz who are widely known in Clearfield, Jefferson and Clarion areas.

Equipment lines to be distributed by Highway in Du Bois are the same as those sold, serviced and rented by this company in Pittsburgh. The list includes Allis-Chalmers tractors, tractor shovels, scrapers and graders; Jaeger air compressors, pumps and concrete and plaster mixers; Gar Wood ditchers; Lima shovels, cranes, draglines and Roadpackers; Thor air tools; Michigan tractor shovels and excavator-cranes; Master concrete vibrators and finishing equipment; General Motors diesel engines and others.



Bob Cooper applies a wealth of experience to his duties as parts manager.

Jim Walker makes out order at parts counter.

Tom Rice, assistant parts manager, handles service requisition.

New Du Bois branch of Highway Equipment Company

25TH Anniversary HIGHWAY EQUIPMENT CO. 1933 · 1958

Highway Equipment Company announces the opening of new sales, service and parts headquarters at

40 Hoover Avenue
Du Bois,
Pennsylvania

J. F. Docherty, Jr., general manager

Robert Cooper, parts manager

Gene Lerch, service manager

Highway

HIGHWAY EQUIPMENT COMPANY
Du Bois • Pittsburgh

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master
General Motors Diesel Engines • Power-Pack Conveyors
Gar Wood • Lima Roadpackers • Thor • Jaeger
Michigan Tractor Shovels and Excavator-Cranes

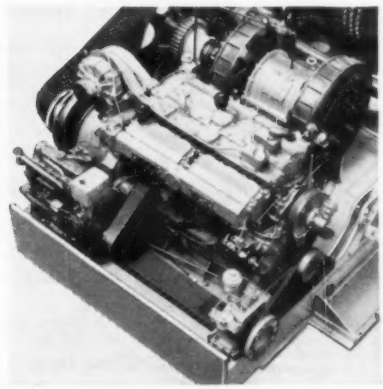
a quick guide to increased mining output with the Manitowoc 4500

SOLID STABILITY

Look at this massive carbody and these long, wide crawlers! A solid base and a low ground bearing pressure of only 9.6 lbs. per sq. inch let you work right at the edge of a bank.

DIRECT POWER FLOW

No one but Manitowoc gives you a slide pinion design that directs power straight to the "business end". Only gears that are working turn and there are only 15 gears in the entire unit!



UNIFIED POWER PACKAGE

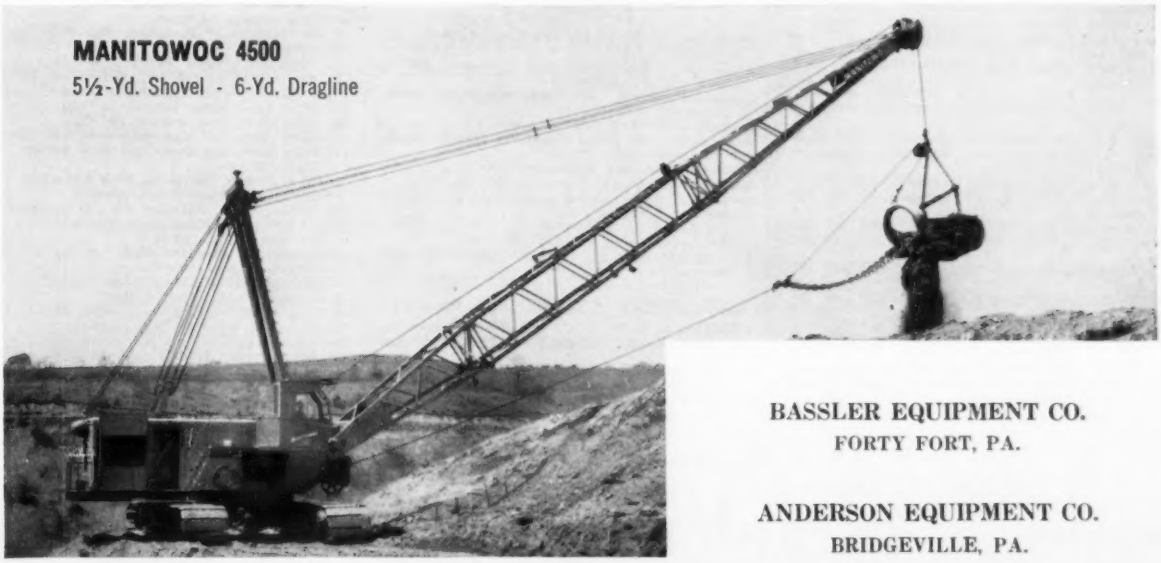
The 4500 is diesel engine powered with the capacity to tackle any job. There are no fussy electric motors . . . no dead-weight . . . no delicate circuits.

GREATER MOBILITY

Your operator travels steep grades without "babying" his machine . . . there's no rocking when moving. Lets you mine anywhere! And fast between job moves can be made by rail or highway trailer.

HI-LIFT BOOM

A 60′ Hi-Lift shovel boom and a 45′ stick are available to give extra reach and height. Standard 120′ dragline boom handles 6-yd. bucket . . . special 140′ boom and 4-yd. bucket extends digging range.



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NO SLEEPING PILLS NEEDED

You don't need to lie awake wondering where you can buy the Best and the Latest mining equipment for the Least money from the largest selection anywhere J. T. FISH IS THE MAN TO SEE.

No use to worry where to Sell your Mining Equipment. No item too small. No Quantity too large. Fair prices the year-round. Spot cash always!

WE BUY — SELL — TRADE

JOY EQUIPMENT—REBUILT

1—Joy 8AE Super 14BU Loader, rebuilt.
3—Joy 14-BU Loaders, low pedestal, 7AE.
2—Joy 14-BU Loaders, medium pedestal, 7RBE.
1—Joy 14-BU Loader, high pedestal, 7BE.
2—Joy 12-BU Loaders, 9E, latest type.
1—Joy 12-BU Loader,, 220 volt AC.
1—Joy 20-BU Loader, latest type.
1—Joy 11-BU Loader, latest type.
2—Joy 8-BU Loaders, 250 volt DC.
1—Joy 8-BU Loader, 34" overall height.
2—Joy 8-BU Loaders, 220 volt AC.
1—Joy curved Bar Head, complete.
2—Reliance 38-J Motors, 10 H. P.
6—Reliance 24-J Motors, 7½ H.P.
4—Reliance 10-J Motors, 5 H. P.
20—9-J Motors, 4 H.P.
6—New Wheel Units for Joy 6 SC Shuttle Car.
1—Goodman 660 Loader on cats, excellent.
1—Goodman 665 loader on cats, latest type.
2—Joy 8SC Shuttle Cars, rebuilt.
2—Joy 6 SC Shuttle Cars, rebuilt.
2—Joy 5 SC Shuttle Cars, rebuilt.
2—Joy 32E9 Shuttle Cars.
2—Joy 32E10 Shuttle Cars, rebuilt.
2—Joy 32E15 Shuttle Cars, rebuilt.
1—Joy 32E16 Shuttle Car, rebuilt.
2—Joy 42E16 Shuttle Cars, rebuilt.
3—Joy CD-22 Drills, like new.
1—Joy T-2-5 low pan Cat Truck.
1—Joy T-2-6 low pan Cat Truck with reel.
2—Joy T-1 Standard Cat Trucks, 220 AC.
1—Joy T-1 Standard Cat Truck, 250 DC.
2—Joy 11-B Cutting Machines, like new.
1—Joy 7-B Cutting Machine, like new.
2—Jov 7-B Cutting Machines, 220 440 volt AC.
1—Goodman Machine on Cats, 31" high. All hydraulic.
6—Goodman 512 machines. with Bugdusters.
1—Goodman 512 cutting machine, perfect.
4—Goodman 512 cutting machines 220/440 volt AC.
3—Goodman 112 Cutting Machines, 220/440 volt AC.
1—Jeffrey 35-L Cutting Machine, 220/440 volt AC.
1—LeeNorse low vein Machine Carrier on rubber.
2—Jeffrey 70 URB's, rubber-tired Cutters, Universal head, perfect condition.
1—Joy 10 RU Rubber-tired Cutter, first class.
1—Joy 11RU, rubber-tired Cutter with bugdusters, Universal head, like new.
2—Jeffrey 29UC Cutting Machines, Universal head, cuts anywhere in seam, 38" high, on cats, 250 volt DC.

LOCOMOTIVES

3—Jeffrey 13 ton, type MH-110. 36", 42" and 44" Ga.
2—Jeffrey 10 ton, type MH-110, 42" and 44" Ga.
1—Jeffrey MH-124, 6 ton, 24" overall height.
12—Jeffrey, 6 ton, type MH-88, 42", 44" and 48" Ga.
2—Jeffrey, 8 ton, type MH-100, 2" armor plate frames.
1—Jeffrey, 6 ton, type 2186, 22" above rail.
3—Jeffrey, 4 ton, type MH-96, 42", 44" and 48" Ga.
1—G. E., 4 ton, type 825 Locomotive, 22" high.
10—G. E., 6 ton, types 801, 803, 821 Locomotives, 42", 44" and 48" Ga.
1—G. E., 8 ton, type 822 Locomotive, 44" Ga.
3—G. E., 10 ton, type 809 Locomotive, 42", 44" and 48" Ga.
2—Goodman, type 33, 6 ton, 44" and 48" Ga.
3—Goodman, 8 ton, type 32A, 36", 44" and 48" Ga.
3—Westinghouse, type 902, 4 ton, 42" and 48" Ga.
2—Westinghouse, type 904, 6 ton, 44" and 48" Ga.
2—Westinghouse, type 906, 44" and 48" Ga.
2—Westinghouse, type 907, 10 ton, 44" and 48" Ga.
2—Diesel Locomotives, 8 and 10 tons, Excellent.
8—Jeffrey MH-78 Locomotive Units, cheap.
3—Plymouth Diesel Locomotives, 8 and 10 tons, 42 in. and 44 in. Ga.

LOCOMOTIVES (Cont.)

4—Jeffrey MH-88 Locomotive Units, real bargains.
6—Jeffrey MH-100 Locomotive Units, reasonable.
Locomotive Trucks and Spare Armatures for all the above.

TIPPLE EQUIPMENT

1—Cedar Rapids portable super Screening Plant.
1—Allis Chalmers 5'x14' Rippflo Vibrator.
1—5'x14' Robins double deck Vibrator.
1—4'x10' Robins Gyrex Vibrator.
1—Rober's & Schaeger tandem Hydro-Separator. Belt Loading Boom.
1—Robins Car Shakeout.
10—Crushers, various sizes.
Feeders, Drag Conveyors and Loading Booms.

CUTTING MACHINES

1—Joy 11RU, rubber tired, Cutter.
1—Joy 10RU, rubber tired Cutter.
2—Jeffrey 70URB Cutters, rubber-tired, Universal Head, low vein.
3 Jeffrey 29UC Universal Machine on Cats.
1—Joy rubber-tired 11RU Cutter with bugdusters.
1—Goodman on Cats, 31" overall height.
3—Baby Goodman 212's, rebuilt, 250 volt DC.
1—Baby Goodman 212, rebuilt, 220 volt, 3 phase AC.
1—Goodman 312, 18" high.
6—Goodman 512's with Bugdosters, like new.
4—Goodman 512's, rebuilt, or as removed from service.
4—Goodman 512's, 220/440 volt AC.
3—Goodman 112's 220/440 volt AC.
1—Jeffrey 35-L Cutting Machine, 220/440 volt AC.
2—Joy 7-B Cutting Machines, 220/440 volt AC.
2—Joy 11B Cutting Machines, rebuilt.
6—Goodman 12AA's and 112AA's.
2—Goodman 324 Slabbers.
2—Goodman 724 Slabbers.
6—Jeffrey 35L's, like new, 17" high.
2—Jeffrey 35L's, on low vein trucks.
1—Jeffrey 35L, 220 volt AC.
15—Jeffrey 35B's and 35BB's.
2—Jeffrey 29B's on track.
2—Jeffrey 29C's track mounted.
1—Jeffrey 29L on track, perfect.
2—Sullivan CR-10's, 15" high.

LOADING MACHINES

16—Loaders, all types.
2—Jeffrey 61 CLR's on rubber, 26".
3—Jeffrey L-500 Loaders.
2—Myers Whaley No. 3 Automat Loaders.
2—Clarkson Loaders, 26" above rail.

CONVEYORS

1—Jeffrey 52-B, 30 in. Conveyor, 1,000 ft. Excellent.
4—Joy 30" Underground Belt Conveyors, 500' to 2000' each. Excellent.
1—Barber Greene 30" Belt Conveyor, 1000'. Excellent.
1—Robins 30" Belt Conveyor, 1000'.
1—Jeffrey 52-B, 26 in. Conveyor, 1200 ft. each.
3000' Conveyor Belt, 30".
2—61EW Elevating Conveyors
2—61WH 15" Room Conveyors, 300 ft.
2—Joy 15" Room Conveyors, 300'.
2—Joy 20" Conveyors, 300'.
4—Joy Ladel UN-17 Shakers.
10—Goodman G-12½ and G-15 Shakers.
3—Long 400 DBH 15" Chain Conveyors, 25 H.P. Motors, new.

CONVERTERS AND DIESEL PLANTS

1—50KW, G. E. TC-6, 275 volt Rotary Converter.
2—100KW, G. E. TCC-6's, 275 volt, Rotary Converters.
1—150KW, G. E. HCC-6, 275 volt, Rotary Converter.
1—150KW, 6 phase, Allis Chalmers Rotary Converter, 275 volt DC, perfect.

Converters and Diesel Plants (Cont.)

1—200KW Allis Chalmers, Rotary Converter 6 phase, 275 DC, perfect.
1—200KW, G. E. HCC-6 Rotary Converter, 275 volt DC.
1—300KW Portable Rectifier.
3—300KW, G. E. HCC-6 Rotary Converters, 275 DC.
3—300KW Westinghouse, 6 phase, Rotary Converters, 275 volt DC.
1—375KW Westinghouse Rotary Converter, 275 volt.
2—500KW Westinghouse Rotary Converters, 275 volt DC.
1—200KW Westinghouse Rotary Converter, 275 DC.
(all the above with 6900/13000 and/or 2300/4000 primary transformers)
2—150KW MG Sets, General Electric and Westinghouse.
1—200KW MG Set, Westinghouse, rebuilt.
1—200KW MG Set, General Electric, perfect.
2—150KW Allis Chalmers MG Sets, 275 DC volt, excellent, 220-440 AC volt.
1—300KW Westinghouse, 600 volt MG Set, rebuilt.
2—300KW Westinghouse, 600 volt, 6 phase, Rotary Converters.
4—500KW Westinghouse, 600 volt, DC, 6 phase, Rotary Converters.
1—500KW HCC-6 Rotary Converter, 6 phase, 600 volt DC.
1—Cummins 125 KW, Diesel with 250 volt DC Generator.
1—G. M. C. Diesel Plant with 60 KW Generator, 275 volt DC.
1—G. M. C. Diesel Plant with 85 KW Generator, 275 volt DC.
1—D-13,000 Caterpillar Diesel with 75 KW Generator, 275 volt DC.
1—Allis Chalmers Natural Gas Engine with 100KW Generator, 275 volt DC.
1—700 H. P. Shaft Hoist, complete.
Complete steam plant, will sell all or any part.
Boilers, like new, 1100 H. P. and 500 H.P. Also transformers, turbines, etc.
1—Complete Tipple with Cleaning Plant.

MISCELLANEOUS

4—All Steel Armco Buildings, various sizes.
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1—¾ Yard Shovel and Back Hoe.
1—¾ Yard Crane on Cats.
Battery Supply Tractors, rubber tired.
1—Cantrell Air Compressor on rubber tires.
10—Air Compressors, 1 H.P. to 40 H.P.
2—Joy self propelled rubber tired compressors, 240 cu. ft.
2—Acme Self Propelled rubber tired Compressors, 130 cu. ft.
40—Mine Pumps, all types.
1—Differential 40 Passenger Man-Trip Car.
6—MSA Rock Dusters.
2—Phillips Carriers, 44" and 48" Ga.
2—Barber Greene self propelled Bucket Elevators.
Pipe, Plastic, Steel, Transit, all sizes 1" to 6".
45—Mine Cars, Drop bottom, 42" Ga.
30—Mine Cars, drop bottom, 44" Ga.
100-Mine Cars, 18" high, end dump, 44" Ga.
100-Mine Cars, end dump and drop bottom, 20" high, 48" Ga.
1—10 ton Mine Car Scale with Recorder.
1—150 ton Railroad Track Scale.
15—Brown Fayro HKL and HG Car Spotters.
1—12 ton Differential Slate Larry.
Incline Hoists. 25 to 50 H.P.
1—Jeffrey 6' Aerodyne Fan.
1—Jeffrey 8' Aerodyne Fan.
1—Storage Tank, 8,000 Gallon.
2—Storage Tanks, 4,000 Gallon.
10,000 Five Gallon G. I. Cans, screw lids.
800 tons Relaying Rail 25 # to 80 #.
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300 Transformers from 1 to 2,000 KVA, 110 to 13,000 primary volts.
400 Electric Motors, 3 to 250 H.P.
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2400 Lima Dragline, 110', 6 yd.
4500 Manitowoc Dragline, 120', 5 yd.
111-M Marion Dragline, 100', 4 yd.
1055 P & H Dragline, 80', 4 yd.
955 P & H Dragline, 80', 3 yd.
170-B Bucyrus Erie 6½ yd. Elec. Shovel
150-B Bucyrus Erie 6 yd. Elec. Shovel
4500 Manitowoc 5 yd. H. L. Shovel
120-B Bucyrus Erie 4 yd. Elec. Shovel
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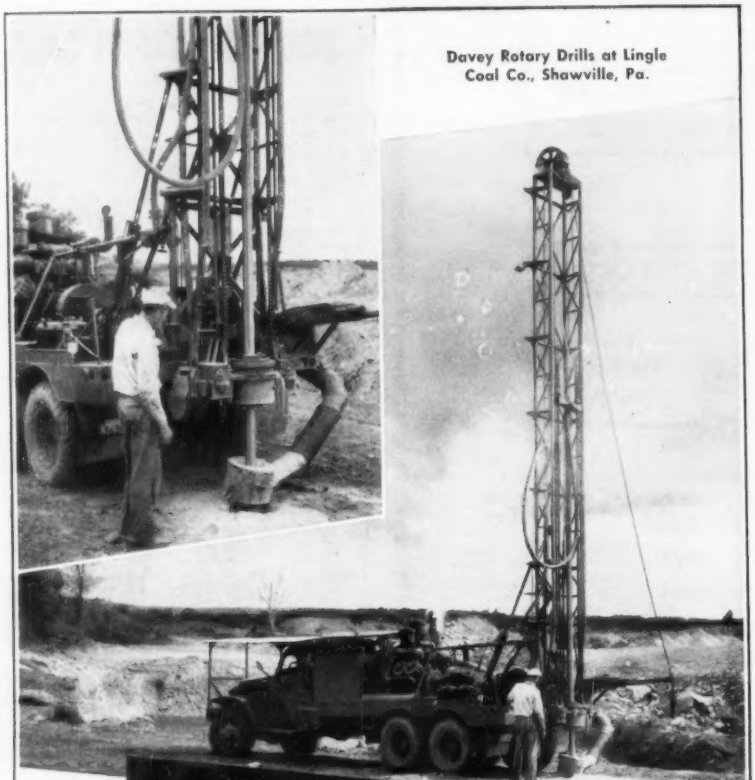

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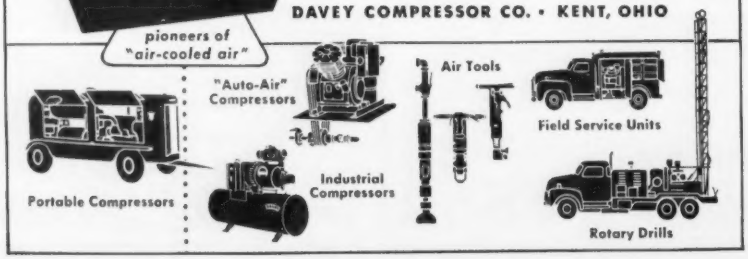

ADVERTISER'S INDEX

JUNE, 1958

Anderson Equipment Co.	23
Austin Powder Company	4th Cover
Bassler Equipment Co.	23
Beckwith Machinery Co.	2, 3, 13, 14, 15, 16, 27
Bucyrus-Erie Company	7
Davey Compressor Co.	26
Fish, J. T.	24
Foster, L. B.	25
Highway Equipment Company	1st, 2nd, 3rd Cover, 22
Jeffrey Manufacturing Company, The	6
Lee Supply Co.	5
Licking View Tool & Machine Co.	5
Long Company, The	4
Manitowoc Engineering Corp.	23
Mine Safety Appliances Company	28
Northeastern Incorporated	25
Ohio Machinery Co.	9, 13, 14, 15, 16
Rolling Hills Const. Co.	25
Salem Tool Company, The	1, 5
Simpson, F. L.	25
Swabb Equipment Co., Inc., Frank	8, 25
Walker Machinery	13, 14, 15, 16
Woodings, Inc., Robert T.	5

● The reduction of engine horsepower caused by operation at high altitudes can now be eliminated on the Caterpillar No. 12 Motor Grader by the use of a Normalizing Kit recently made available by Caterpillar Tractor Co. The No. 12 Motor Grader is the first rubber-tired unit in the Company's line to be provided with the Normalizing Kit. Previously the kit was made available for the Cat D6, D7 and D8 Tractors.

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The Normalizing Kit does not increase the horsepower of the tractor while operating at sea level, but is effective only in providing the needed oxygen at high altitude to burn the same amount of fuel as at sea level. To assure that proper governor setting is maintained, the governor housing is sealed when the normalizing kit is installed.

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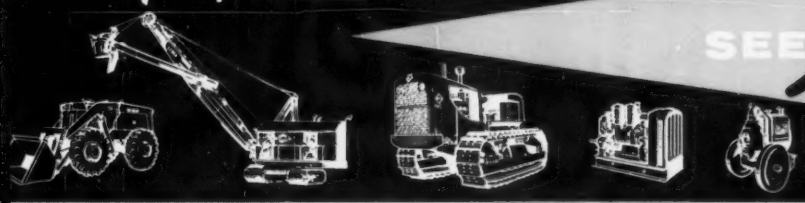

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Such a man is Permissible Pete,
toughest man you'll ever meet.
Whether judged by brain or measured by might,
he stands out front clear as day from night.

Coal is his business, blasting his task
(underground mining to those who ask)
But let's take a look at part of his day
and follow Pete along his toilful way.

Out at the mine as the dawn unfolds
he's anxious to find what the new day holds.
By checking his tools and seeing his crew,
he knows they're ready to start work anew.

Down into the mine and up to the face
where today's blasting will soon take place.
After undercutting the coal, Pete proceeds
to drill blast holes in the pattern he needs.

Then Permissible Pete shows us why
he's regarded as such a brainy guy.
Into each hole he expertly applies
permissible charge that Austin supplies.

With Austin dynamite, there's no doubt
about the results that now come about—
large lump coal with hardly any fines,
just what's wanted by profitable mines.

With coal quickly loaded, the men begin
the same operation all over again.
And so it goes as time passes by,
with daily tonnage exceptionally high.

* * * * *

If Pete were asked, he'd probably say
"We're boosting production the Austin way."
Then he'd continue proving to you
Austin permissibles can boost yours too.

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